

# Service Manual



ORDER NO.  
RRV1945

## RF DEMODULATOR RFD-1

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	The voltage can be converted by the following method.
	RFD-1		
KUC	○	AC120V	_____
SD	○	AC110V/120 – 127V/220V/240V	With the voltage selector

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# 1. SAFETY INFORMATION

This service manual is intended for qualified service technicians ; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.



## WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.



## NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

## REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

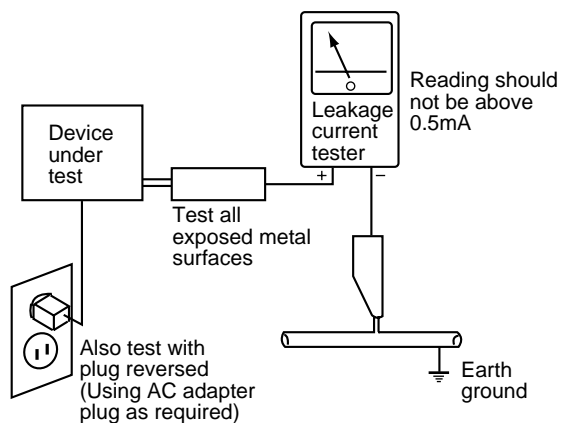
## (FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

#### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

### 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual.

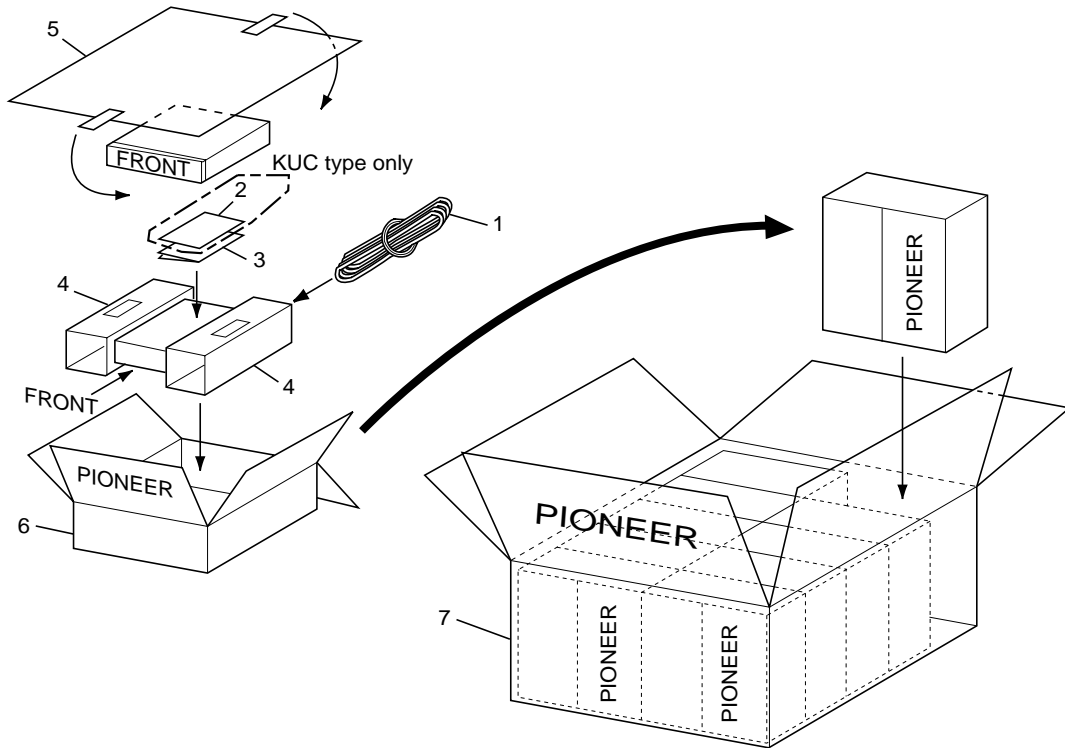
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

## 2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.  
 ● The  $\triangle$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
 ● Screws adjacent to  $\blacktriangledown$  mark on the product are used for disassembly.

### 2.1 PACKING



#### (1) PACKING PARTS LIST

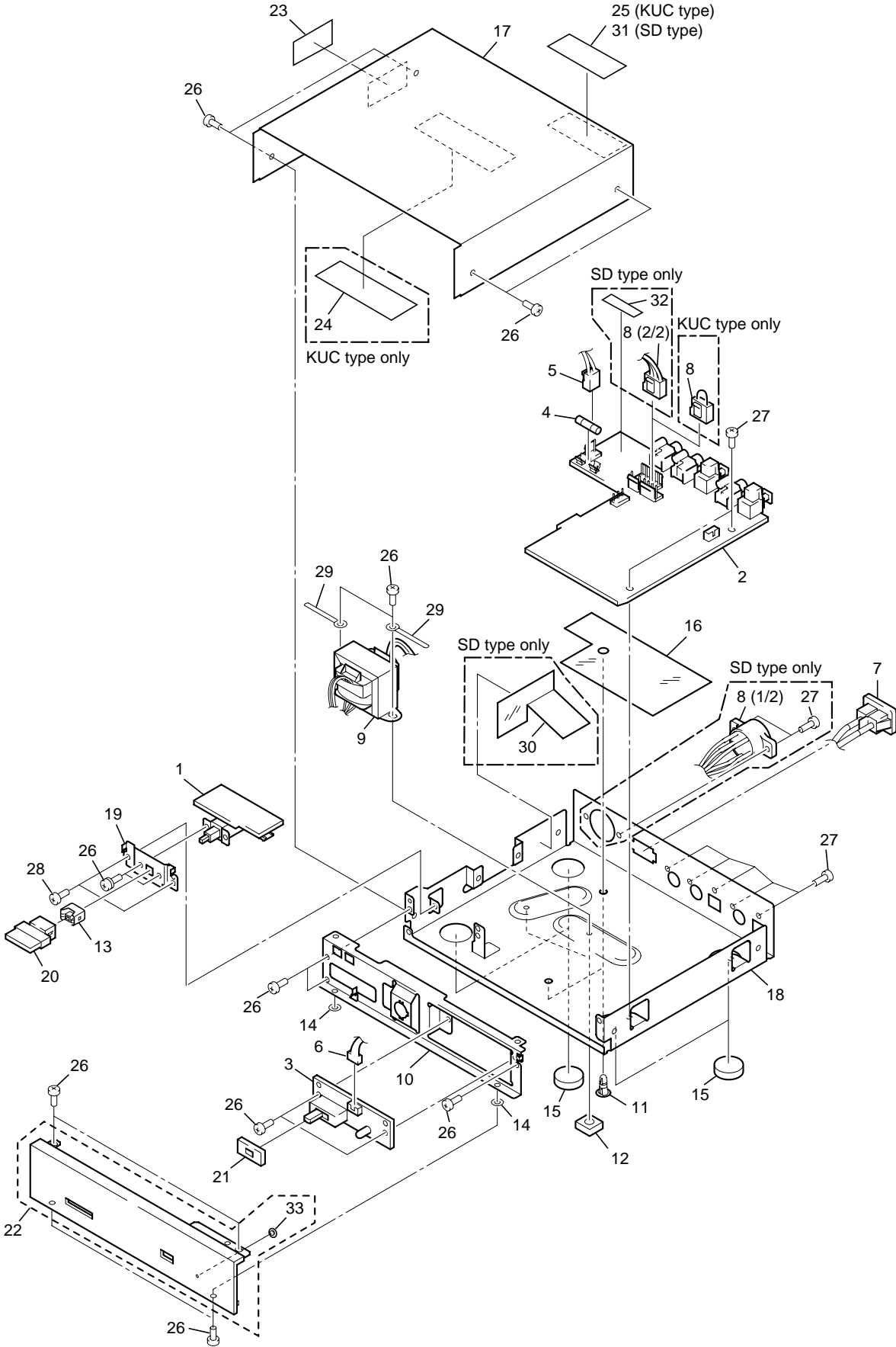
Mark	No.	Description	Part No.
$\triangle$	1	Power Cord	See Contrast table (2)
NSP	2	Warranty Card	See Contrast table (2)
	3	Operating Instructions (English/French/Spanish/Chinese)	VRE1072
	4	Protector	DHA1235
	5	Packing Sheet	RHC1050
	6	Packing Case	See Contrast table (2)
	7	Master Carton	See Contrast table (2)

#### (2) CONTRAST TABLE

RFD-1/KUC and RFD-1/SD are constructed the same except for the following :

Mark	No.	Symbol and Description	Part No.		Remarks
			RFD-1/KUC	RFD-1/SD	
$\triangle$	1	Power Cord	ADG1126	ADG7003	
NSP	2	Warranty Card	ARY1044	Not Used	
	6	Packing Case	VHG1745	VHG1749	
	7	Master Carton	VHG1746	VHG1750	

2.2 EXTERIOR



**(1) EXTERIOR PARTS LIST**

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
NSP △ △	1	SW Assy	VWR1303	NSP	17	Bonnet Case	VNA1952
	2	DEM Assy	VWV1601		18	Main Chassis	See Contrast table (2)
	3	LED Assy	VWY1048		19	SW Stay	VNE2148
	4	FU1 Fuse	See Contrast table (2)		20	Power Knob	VAC1030
	5	Housing Assy (3P)	VKP2178		21	Cushion	VEC1981
△ △ △	6	Housing Assy (4P)	VKP2179		22	Front Panel Assy	VXA2370
	7	AC Inlet Assy	See Contrast table (2)		23	Caution Label	ARW7036
	8	Housing Assy	See Contrast table (2)		24	65 Label	See Contrast table (2)
	9	Power Transformer (AC110V/120-127V/220V/240V)	VTT1153		25	DOC Label	See Contrast table (2)
NSP	10	Front Stay	DND1140	NSP	26	Screw	BBZ30P060FZK
	11	Locking Card Spacer	ONK1035		27	Screw	BBZ30P080FCC
	12	Disc Guard	PNM1245		28	Screw	PMA30P060FMC
	13	Guide Ring	VEC-151		29	Cord Stopper	ZCB-069Z
	14	Washer	VEC1254		30	Sheet A (PVC)	See Contrast table (2)
	15	Poron Leg	VEC1987		31	FCC Label	See Contrast table (2)
	16	Sheet B (PVC)	VEC1990		32	Fuse Label	See Contrast table (2)
					33	LED Lens	DNK2331

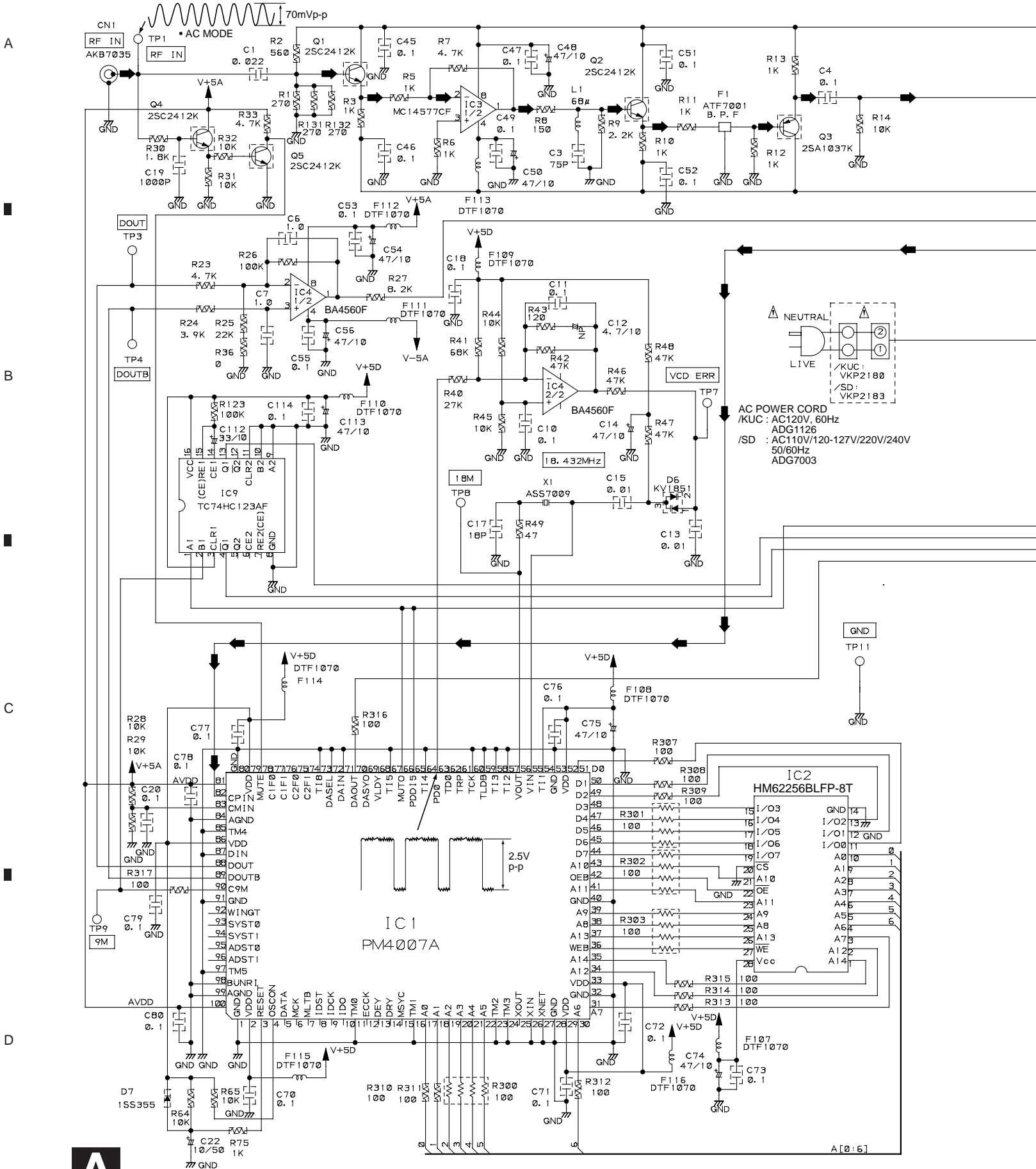
**(2) CONTRAST TABLE**

RFD-1/KUC and RFD-1/SD are constructed the same except for the following :

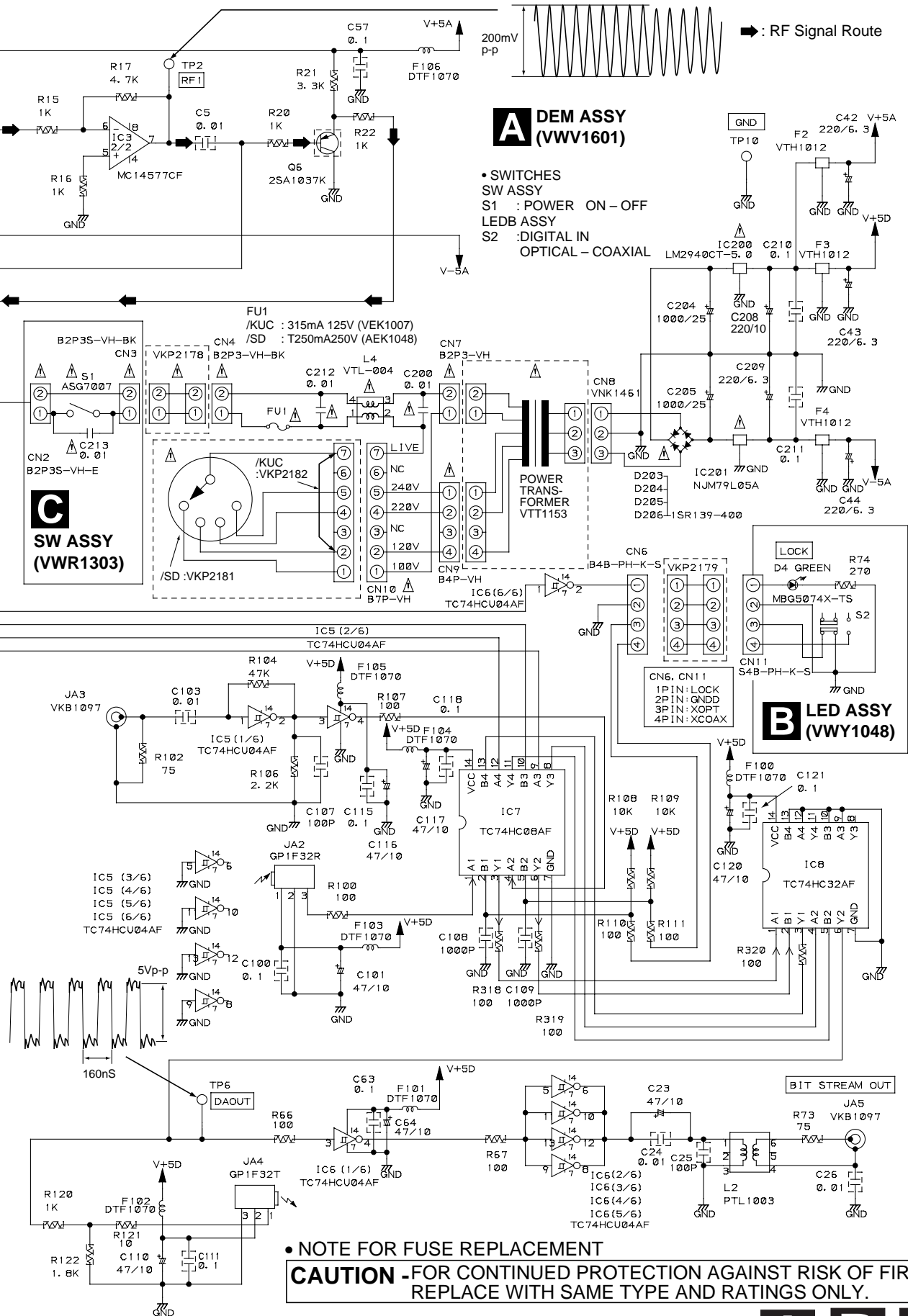
Mark	No.	Symbol and Description	Part No.		Remarks
			RFD-1/KUC	RFD-1/SD	
△	4	FU1 Fuse (315mA)	VEK1007	Not Used	
△	4	FU1 Fuse (T250mA)	Not Used	AEK1048	
△	7	AC Inlet Assy	VKP2180	VKP2183	
△	8	Housing Assy	VKP2182	VKP2181	
NSP	18	Main Chassis	VNA1974	VNA1950	
	24	65 Label	ORW1069	Not Used	
	25	DOC Label	VRW1726	Not Used	
	30	Sheet A (PVC)	Not Used	VEC1993	
	31	FCC Label	Not Used	VRW1725	
	32	Fuse Label	Not Used	VRW1727	

### 3. SCHEMATIC DIAGRAM

#### 3.1 DEM, LED AND SW ASSEMBLIES



Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



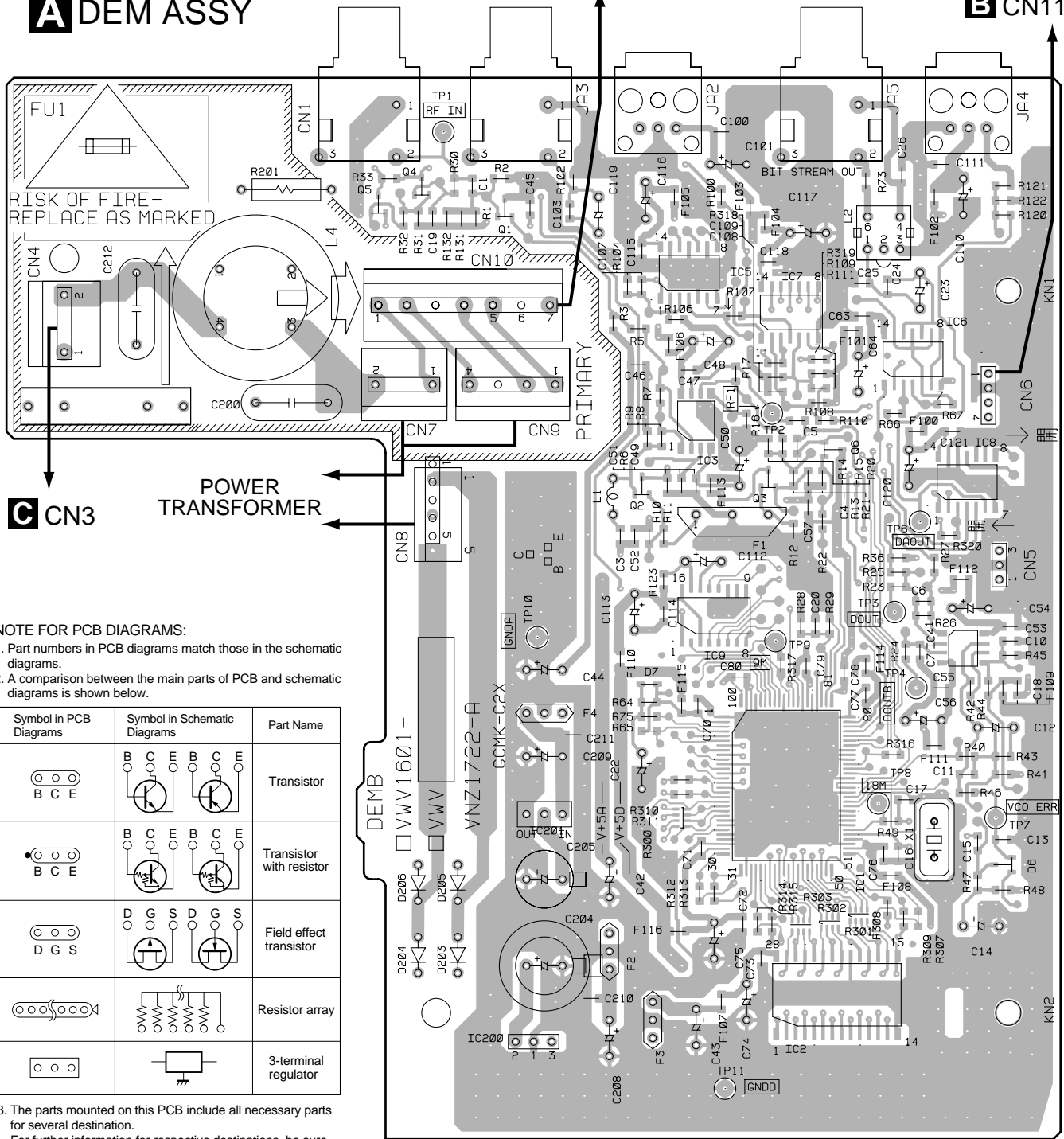


# 4. PCB CONNECTION DIAGRAM

## 4.1 DEM ASSY

KUC type : HOUSING ASSY(VKP2182)  
SD type : VOLTAGE SELECTOR

### A DEM ASSY



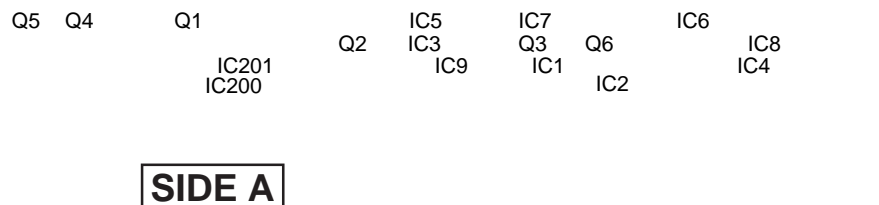
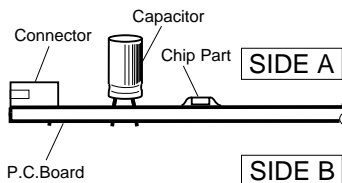
#### NOTE FOR PCB DIAGRAMS:

- 1. Part numbers in PCB diagrams match those in the schematic diagrams.
- 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

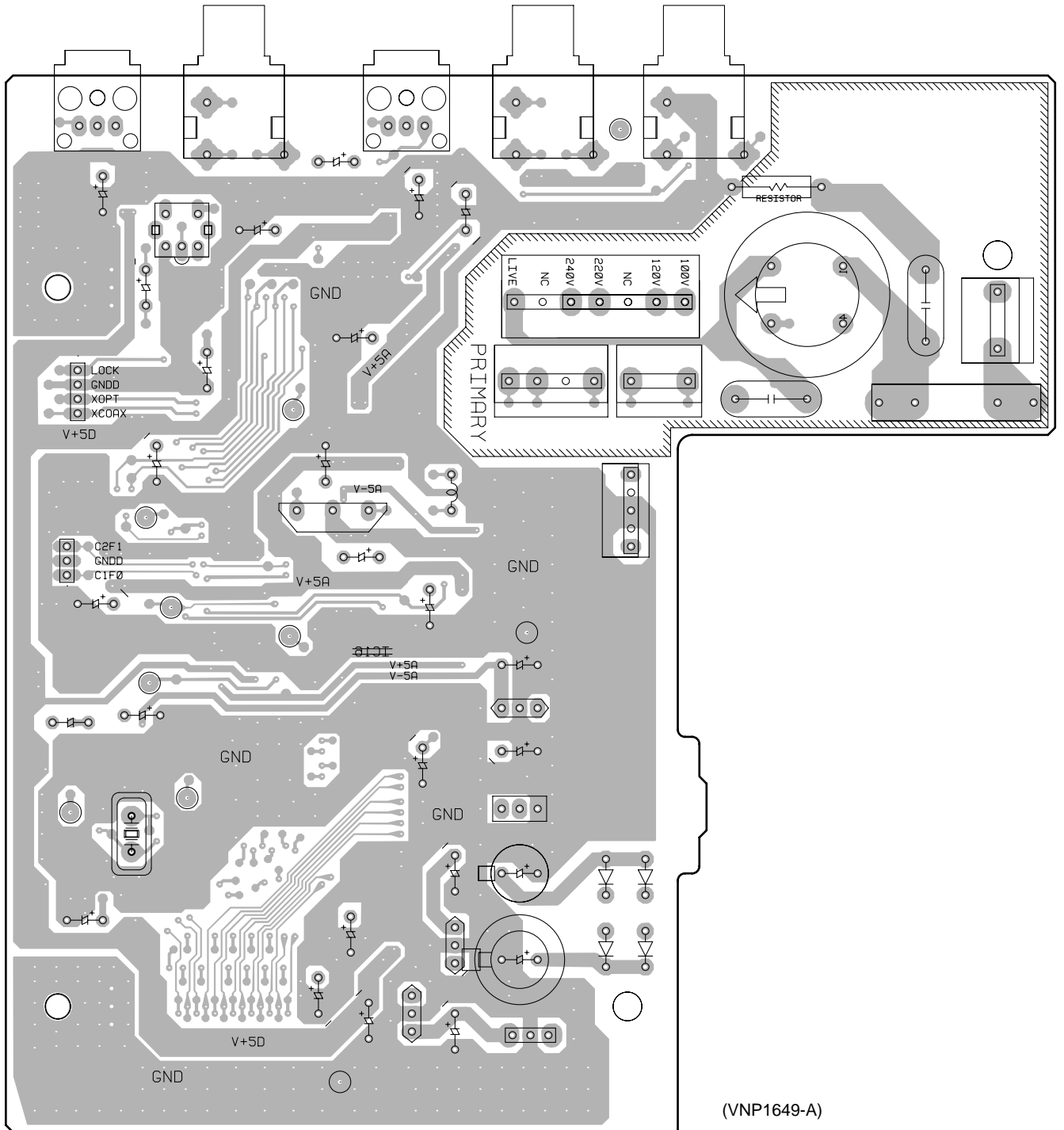
- 3. The parts mounted on this PCB include all necessary parts for several destination.  
For further information for respective destinations, be sure to check with the schematic diagram.

#### 4. Viewpoint of PCB diagrams





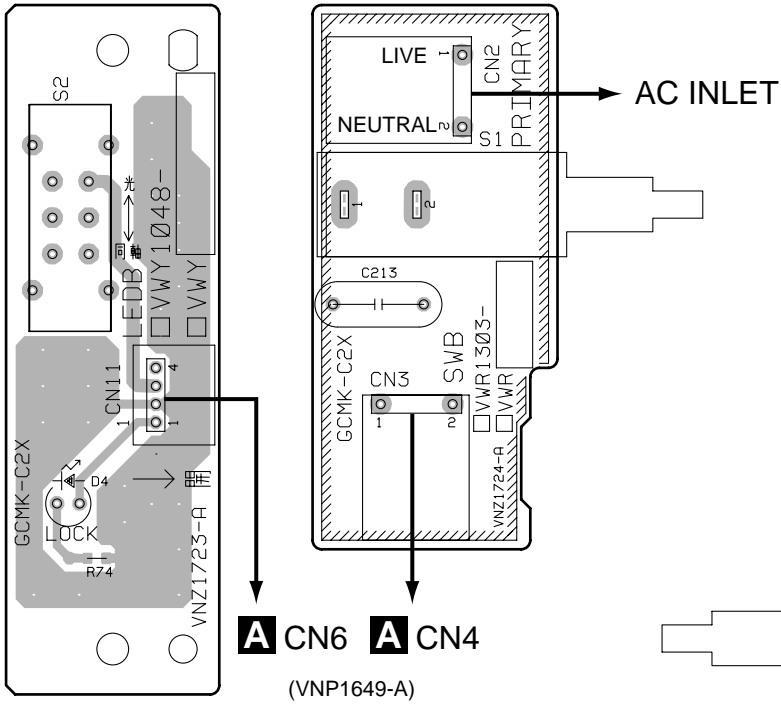
**A** DEM ASSY



**SIDE B**

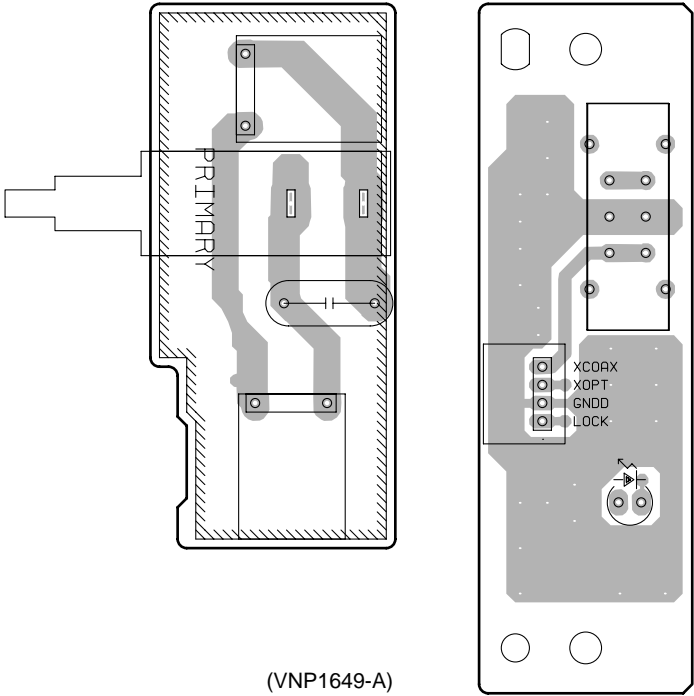
4.2 SW ASSY AND LED ASSY

**B** LED ASSY      **C** SW ASSY



**SIDE A**

**C** SW ASSY      **B** LED ASSY



**SIDE B**

## 5. PCB PARTS LIST

NOTES: ●Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.

●The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

●When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560  $\Omega$   $\rightarrow$   $56 \times 10^1$   $\rightarrow$  561 ..... RD1/4PU  $\boxed{5} \boxed{6} \boxed{1} J$   
 47k  $\Omega$   $\rightarrow$   $47 \times 10^3$   $\rightarrow$  473 ..... RD1/4PU  $\boxed{4} \boxed{7} \boxed{3} J$   
 0.5  $\Omega$   $\rightarrow$  R50 ..... RN2H  $\boxed{R} \boxed{5} \boxed{0} K$   
 1  $\Omega$   $\rightarrow$  1R0 ..... RS1P  $\boxed{1} \boxed{R} \boxed{0} K$

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k  $\Omega$   $\rightarrow$   $562 \times 10^1$   $\rightarrow$  5621 ..... RN1/4PC  $\boxed{5} \boxed{6} \boxed{2} \boxed{1} F$

Mark	No.	Description	Part No.
<b>LIST OF ASSEMBLIES</b>			
NSP	AC3B ASSY	VWM1830	
	└ SW ASSY	VWR1303	
	└ DEM ASSY	VWV1601	
NSP	└ LED ASSY	VWY1048	

### **A** DEM ASSY SEMICONDUCTORS

	IC4	BA4560F
	IC2	HM62256BLFP-8T
$\Delta$	IC200	LM2940CT-5.0
	IC3	MC14577CF
$\Delta$	IC201	NJM79L05A
	IC1	PM4007A
	IC7	TC74HC08AF
	IC9	TC74HC123AF
	IC8	TC74HC32AF
	IC5,IC6	TC74HCU04AF
	Q3,Q6	2SA1037K
	Q1,Q2,Q4,Q5	2SC2412K
$\Delta$	D203-D206	1SR139-400
	D7	1SS355
	D6	KV1851

### COILS AND FILTERS

	F1 BPF	ATF7001
	F100-F116 CHIP BEAD	DTF1070
	L1	LAU680J
	L2 PULSE TRANS.	PTL1003
	F2-F4 EMI FILTER	VTH1012
$\Delta$	L4 LINE FILTER	VTL-004

### CAPACITORS

$\Delta$	C200,C212 (0.01 $\mu$ F/AC250V)	ACG7020
	C107,C25	CCSQCH101J50
	C17	CCSQCH180J50
	C3	CCSQCH750J50
	C108,C109,C19	CCSQSL102J50
	C12	CEANP470M10
	C22	CEAT100M50
	C205	CEAT102M25
	C209,C42-C44	CEAT221M6R3
	C112	CEAT330M16
	C101,C110,C113,C116,C117	CEAT470M10
	C120,C14,C23,C48,C50	CEAT470M10
	C54,C56,C64,C74,C75	CEAT470M10
	C204	CEHAQ102M25
	C208	CEHAQ221M10
	C103,C13,C15,C24,C26	CKSQYF103Z50

	C5	CKSQYF103Z50
	C10,C100,C11,C111	CKSQYF104Z25
	C114,C115,C118,C121,C18	CKSQYF104Z25
	C20,C210,C211,C4	CKSQYF104Z25
	C45-C47,C49,C51-C53	CKSQYF104Z25
	C55,C57,C63,C70-C73	CKSQYF104Z25
	C76-C80	CKSQYF104Z25
	C6,C7	CKSQYF105Z16
	C1	CKSQYF223Z50

### RESISTORS

	R300-R303	RA4C101J
	Other Resistors	RS1/10S $\square\square\square J$

### OTHERS

	X1 CRYSTAL OSCILLATOR (18.432MHz)	ASS7009
	CN1 PIN JACK(1P)	AKB7035
	H1,H2 FUSE CLIP	AKR1003
$\Delta$	CN7 2P CONNECTOR	B2P3-VH
$\Delta$	CN4 2P CONNECTOR	B2P3-VH-BK
	CN6 KR CONNECTOR	B4B-PH-K-S
$\Delta$	CN9 4P TOP POST	B4P-VH
$\Delta$	CN10 7P CONNECTOR	B7P-VH
	JA2 OPTICAL RECEPTION MODULE	GP1F32R
	JA4 OPTICAL LINK OUT	GP1F32T
	JA3,JA5 1P PIN JACK	VKB1097
	CN8 3P TOP POST	VKN1461
	KN1,KN2 EARTH METAL FITTING	VNF1084

### **B** LED ASSY SEMICONDUCTORS

	D4	MBG5074X
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### SWITCH

	S2	DSH1036
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### RESISTORS

	All Resistors	RS1/10S $\square\square\square J$
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### OTHERS

	CN11 KR CONNECTOR	S4B-PH-K-S
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### **C** SW ASSY

#### SWITCH

$\Delta$	S1	ASG7007
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#### CAPACITOR

$\Delta$	C213 (0.01 $\mu$ F/AC250V)	ACG7020
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#### OTHERS

$\Delta$	CN3 2P CONNECTOR	B2P3S-VH-BK
$\Delta$	CN2 2P CONNECTOR	B2P3S-VH-E

## 7. GENERAL INFORMATION

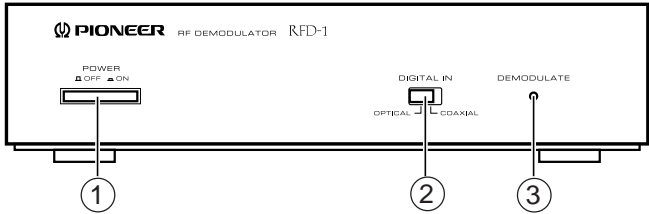
# DIAGRAM

The diagram illustrates a radio receiver system with the following components and connections:

- RF Input:** CN1 (AC-3 RF IN) connects to a BPF (Bandpass Filter) and a mixer (CN1).
- Demodulation:** The mixer output goes to IC1: PM4007A (Demodulation). IC1 has inputs CPIN, CMIN, DOUT, and DOUTB, and outputs A(14:0), DB(7:0), OEB, and WEB.
- Addressing and Timing:** IC1's A(14:0) output goes to an Address Generator. Its DB(7:0) output goes to a Timing Generator. The Timing Generator's output goes to an Error Correction block.
- Control and Output:** The Error Correction block's output goes to a DAC Controller (IC9: TC74HC123AF). The DAC Controller has inputs MUTO and DAOUT, and outputs Serial Data and DAOUT.
- Power Supply:** A POWER TRANSFORMER provides a primary input. The secondary output goes to a full-wave rectifier (D203-D206). The rectifier output goes to two voltage regulators: IC200: LM2940CT-5.0 (providing +5V) and IC201: NJM79L05 (providing -5V).
- Other Components:**
  - VCXO 18.432MHz (Variable Frequency Oscillator) provides a 9kHz signal to IC1 and a 9.216MHz signal to IC9.
  - Phase Comparator and 1/2048 Divider 1/2 are used for frequency division.
  - Capacitors (C9M) and resistors (D4) are used for timing and signal conditioning.
  - Switches (S1, S2) are used for signal routing.

# 8. PANEL FACILITIES AND SPECIFICATIONS

## PANEL FACILITIES



- ① **POWER switch**  
Provides electrical power to the unit.
- ② **DIGITAL IN switch**  
Use to select which of the DIGITAL IN terminals to use (either COAXIAL or OPTICAL).
- ③ **DEMODULATE indicator**  
When lighted, indicates that the input signal supplied to the Dolby Digital (AC-3) RF IN terminal is being demodulated.

"Dolby", "Digital (AC-3)" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

## SPECIFICATIONS

### General

Power requirements  
US and Canadian models ..... AC 120 V, 60 Hz  
Multi-voltage model ..... AC 110/120-127/220/240 V  
(Switchable) 50/60 Hz  
Power consumption ..... 6 W  
Weight ..... 1.1 kg (2 lb 7 oz)  
Dimensions ..... 202 (W) × 194 (D) × 50 (H) mm  
7-15/16 (W) × 7-5/8 (D) × 1-31/32 (H) in

### Accessories

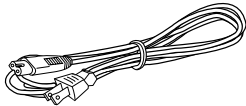
- Operating instructions ..... 1
- Power cord ..... 1

#### NOTE:

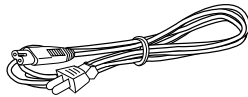
Specifications and design are subject to possible modification without notice.

### Accessories

Power cord



KUC type  
(ADG1126)



SD type  
(ADG7003)